Teaching in Focus #35

Teachers' training and use of information and communications technology in the face of the COVID-19 crisis

Teaching & Learning

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Teachers' training and use of information and communications technology in the face of the COVID-19 crisis

- Analysis of TALIS 2018 data reveals that pre-service education and in-service training including information and communications technology (ICT) for teaching are positively related with the use of ICT in teaching and learning.
- It also reveals that schools that encourage staff to lead new initiatives offer a fertile environment for the integration of ICT into teaching practice.
- Further analyses suggest that promoting pre-service programmes that include ICT for teaching is one way to encourage teachers to continue to participate in professional development activities aiming at maintaining and enhancing their capability to integrate new technology into their teaching practice.

The COVID-19 outbreak has caused one of the greatest disruptions to education witnessed in recent years. In an attempt to prevent the circulation of the virus and to ensure the right to education, many governments quickly transitioned from traditional face-to-face instruction to some form of distance learning. To ensure learning continuity during the school closures, many teachers around the globe were tasked with moving their lessons on line.

However, the rapid transition to online education has worked against students who do not have access to information and communications technology (ICT) at home, have limited parental support, or are not used to studying and learning on their own. The switch to online education has also certainly penalised students who have never been exposed to ICT by their teachers, as well as those students who their teachers believed did not feel comfortable with these new technologies.

There is some evidence that education systems are moving to a "new normal" where traditional face-to-face instruction will be complemented by some form of distance learning. Even though data collection was conducted before the COVID-19 outbreak, the OECD's Teaching and Learning International Survey (TALIS 2018) offers some useful information to illuminate why some teachers are more likely to let students use ICT for projects or class work than others, and to explore the factors behind whether teachers take up professional development activities that include ICT skills for teaching.

What is TALIS?

The Teaching and Learning International Survey (TALIS), established in 2008, is the first major international survey of teachers and school leaders on different aspects affecting student learning. It gives a voice to teachers and school leaders, allowing them to provide input into educational policy analysis and development in key areas.

The international target population for TALIS 2018 is lower secondary teachers and their school leaders in mainstream public and private schools. For the 2018 survey, a representative sample of 4 000 teachers and their school principals from 200 schools were randomly selected in each country. Across all survey components, approximatively 260 000 teachers responded to the survey, representing more than 8 million teachers in 48 participating countries and economies.

In this *Teaching in Focus*, a TALIS average is estimated based on the arithmetic average of lower secondary teacher data across the 48 OECD countries and economies participating in TALIS.

Data collection took place between September and December 2017 for Southern Hemisphere participants and March to May 2018 for Northern Hemisphere participants. Since the data were collected before the COVID-19 crisis, please note that some of the frequencies and relationships among the variables reported here may have changed. More information is available at www.oecd.org/education/talis.

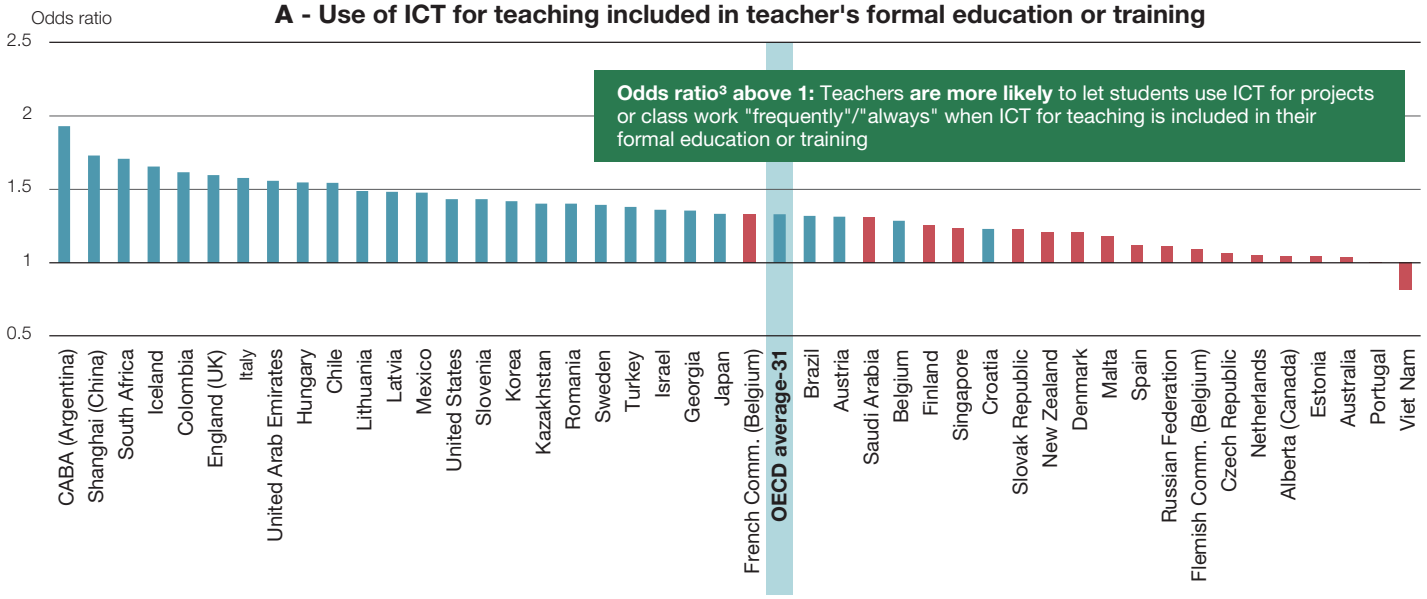
Why are some teachers more likely to let students use ICT for projects or class work than others?

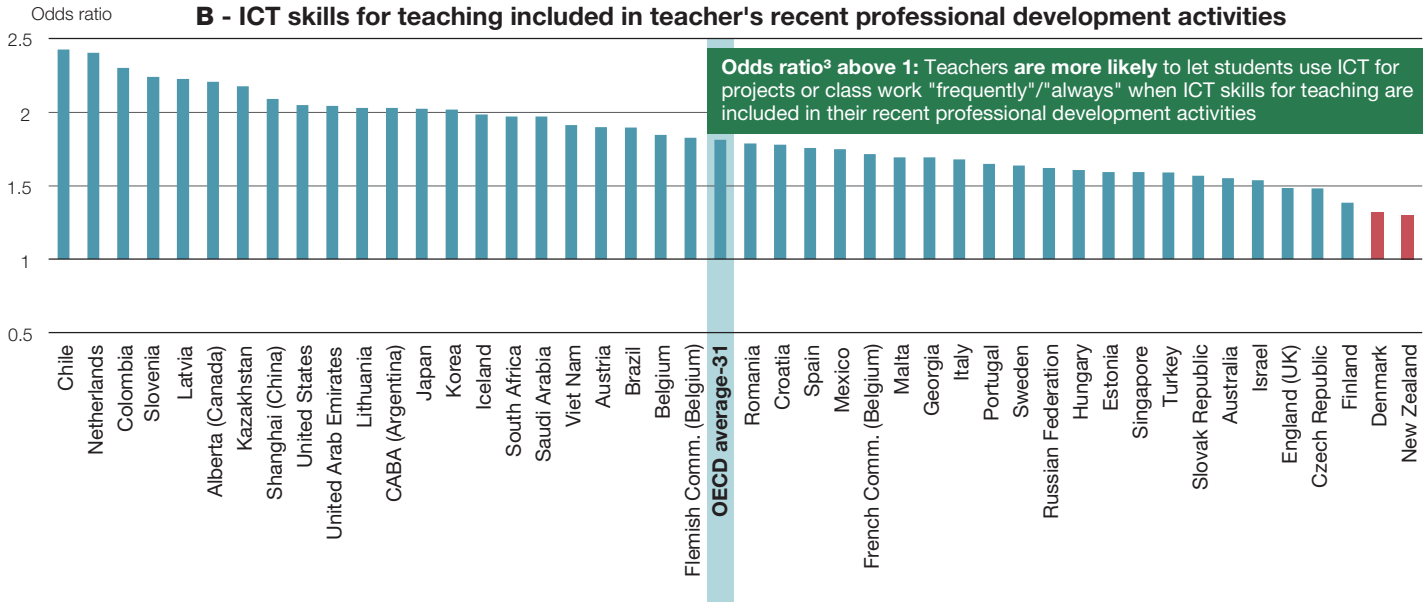
A good starting point for assessing how well education systems were prepared for school closures and, hence, how fast they might adapt to the changes following the COVID-19 outbreak, is to explore how well prepared teachers felt they were to integrate ICT into classroom practice and how frequently ICT was used for teaching before the crisis.

On average across the OECD, only slightly more than half of lower secondary teachers (53%) reported letting students "frequently" or "always" use ICT for projects or class work. Understanding why some teachers are more likely than others to integrate ICT in their teaching activities can help education systems reduce the risk that some students do not get enough exposure to these new media in school.

Logistic regression analysis of TALIS 2018 data shows that pre-service teacher education and in-service teacher training are two important drivers of teachers' adoption of ICT in their teaching activities. When ICT for teaching was included in their formal education or training, in 27 out 45 TALIS countries and economies with available data teachers are more likely to let students "frequently" or "always" use ICT for projects or class work. In all but two TALIS countries and economies with available data, teachers are more likely to let students "frequently" or "always" use ICT for projects or class work when ICT skills for teaching were included in their recent professional development activities (Figure 1A and Figure 1B, Table 1[1]; see Tables 3 and 4 for some descriptive statistics).

Figure 1. Relationship between how frequently teachers let students use ICT for project or class work and inclusion of ICT for teaching in teacher's formal education/training or in teacher's recent professional development activities
Likelihood of letting students use ICT "frequently" or "always" for projects or class work[1, 2]



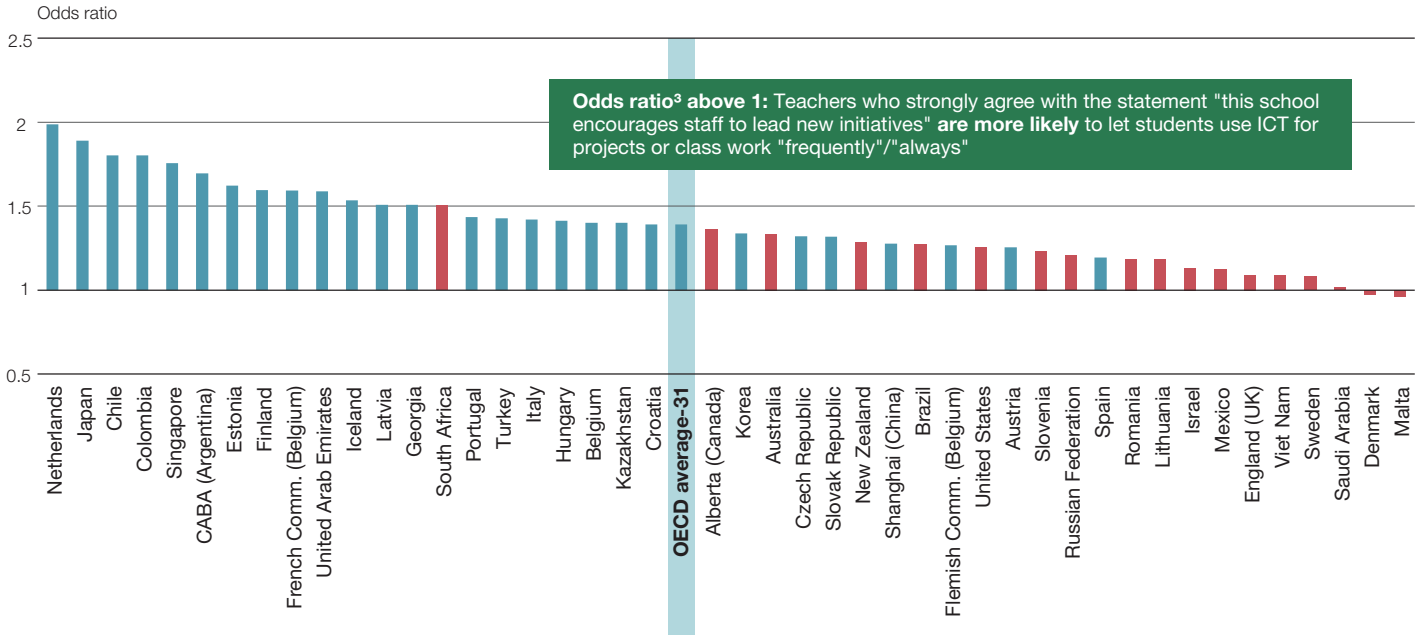


1. Results of binary logistic regression based on the responses of lower secondary teachers.
2. Controlling for the following teacher variables: gender, years of teaching experience, perceived control over teaching methods, perceived need to increase the investment in ICT and being in a school that encourages staff to lead new initiatives; and for the following classroom characteristics: share of low achieving students, share of students from socio-economically disadvantaged homes and share of academically gifted students.
3. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below one denotes a negative association, an odds ratio above one indicates a positive association and an odds ratio of one means that there is no association.
Notes: Only countries and economies with available data are shown.
Statistically significant values are marked in a blue tone.
Countries and economies are ranked in descending order of teachers' likelihood of "frequently" or "always" letting students use ICT for projects or class work.
Source: OECD, TALIS 2018 Database, www.oecd.org/education/talis/TIF35_Tables_Teachers_training_and_use_of_ICT_in_COVID-19_crisis.xlsx, Table 1

Whether and how teachers integrate ICT into their classroom practice is influenced by a wide array of organisational and system-level conditions, in addition to their pre-service education and in-service training. Education and training initiatives including ICT for teaching are important, but they are not enough. For instance, logistic regression analysis confirms that school environments play a critical role in promoting innovative teaching practices. On average across the OECD, the odds ratio[2] of letting students use ICT for projects or class work at least frequently is 1.4 among teachers who strongly agree with the statement "this school encourages staff to lead new initiatives", and it is significantly above 1 in more than half the TALIS countries and economies with available data (Figure 2, Table 1). In other words, in these countries and economies, the schools that encourage staff to lead new initiatives offer a fertile environment for the integration of ICT into classroom practice

Figure 2. Relationship between how frequently teachers let students use ICT for project or class work and school support for new initiatives

Likelihood of letting students use ICT "frequently" or "always" for projects or class work[1, 2]



1. Results of binary logistic regression based on the responses of lower secondary teachers.
2. Controlling for the following teacher variables: inclusion of ICT for teaching in formal education or training, inclusion of ICT skills for teaching in recent professional development activities, gender, years of teaching experience, perceived control over teaching methods, perceived need to increase the investment in ICT and being in a school that encourages staff to lead new initiatives; and for the following classroom characteristics: share of low achieving students, share of students from socio-economically disadvantaged homes and share of academically gifted students.
3. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below one denotes a negative association, an odds ratio above one indicates a positive association and an odds ratio of one means that there is no association.

Notes: Only countries and economies with available data are shown.
Statistically significant values are marked in a blue tone.
Countries and economies are ranked in descending order of teachers' likelihood of "frequently" or "always" letting students use ICT for projects or class work.
Source: OECD, TALIS 2018 Database, www.oecd.org/education/talis/TIF35_Tables_Teachers_training_and_use_of_ICT_in_COVID-19_crisis.xlsx, Table 1

Why are some teachers more likely than others to undertake professional development activities that include ICT skills for teaching?

TALIS 2018 data show that, on average, the second most important professional development need among lower secondary teachers relates to ICT skills for teaching (18% of teachers report this need) while four out of ten teachers did not attend any professional development activity including this subject in the 12 months prior the survey (40% of teachers).

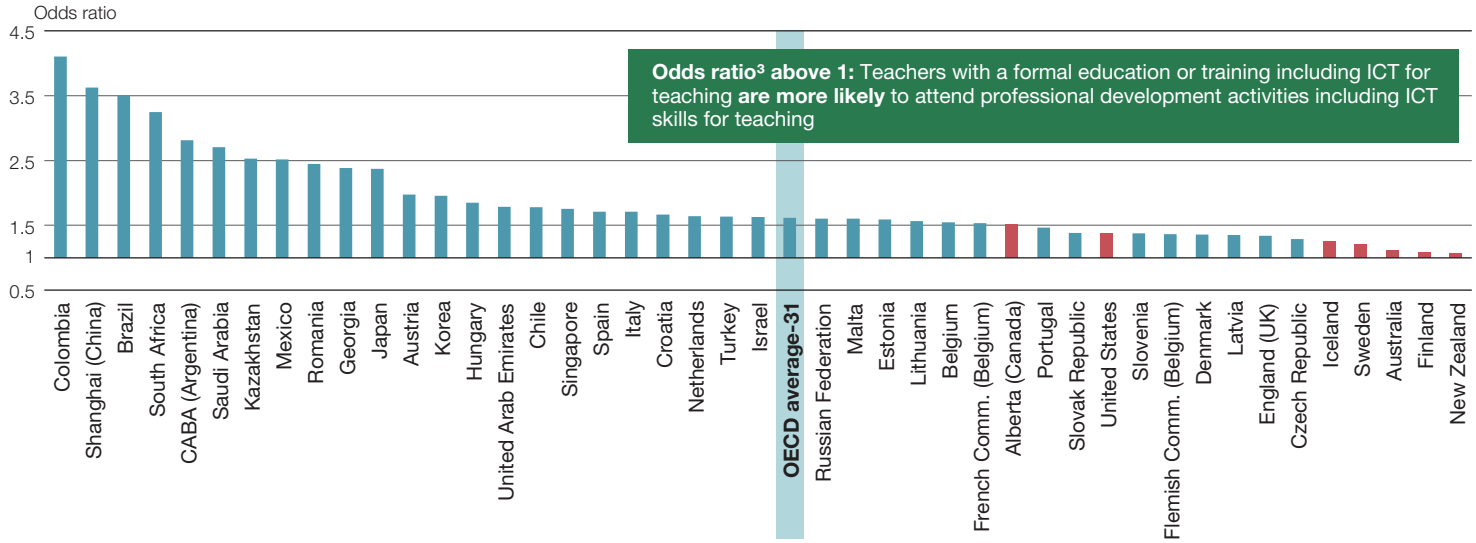
Across the OECD, participation rates in recent professional development activities that include ICT skills for teaching are slightly higher among men than women (on average 62% for male teachers compared with 59% for female teachers); among more experienced teachers than novice teachers (on average 61% for experienced teachers compared with 58% for novice teachers); among teachers teaching science, technology, engineering and mathematics (STEM) subjects (on average 64% for STEM teachers compared with 59% for non-STEM teachers); and among teachers with a permanent contract (on average 61% for teachers with permanent employment compared with 56% for teachers with a fixed-term contract). Interestingly, examination of TALIS 2018 data also shows that, on average, the participation rate in recent professional development activities that include ICT for teaching is almost 10 percentage points higher among the teachers

who had ICT for teaching as part of their formal education or training. On average, 64% of the teachers whose formal education or training included ICT for teaching participated in such activities, compared with 55% of their counterparts (Tables 4 to 8).

Logistic regression analysis confirms that, everything else being equal, teachers' participation in professional development activities that include ICT skills for teaching is related to whether ICT for teaching was included in their past formal education or training. Figure 3 shows the country-level predicted effect of teachers' reported past participation in pre-service education or training that included ICT for teaching on their likelihood of reporting that they had recently participated in professional development activities covering these skills. In the vast majority of TALIS countries and economies, teachers who reported an ICT element to their formal education or training are more likely to report participating in ICT-related professional development activities. Although the results should be interpreted with a certain caution, the significant positive relationships shown in Figure 3 could indicate that promoting pre-service programmes that include ICT for teaching is an instrument to encourage teachers to keep participating in professional development activities aiming at maintaining and enhancing their ability to integrate new technologies into their teaching practice. Yet, this result could also signal that teachers who reported an ICT element in their past formal education feel less confident about integrating new technologies into their teaching practice and, as a consequence, more inclined to participate in professional development activities on this matter.

Figure 3. Relationship between recent participation in professional development in ICT skills for teaching and ICT for teaching as part of teacher's formal education or training

Likelihood of participating in professional development activities including ICT skills for teaching[1, 2]



1. Results of binary logistic regression based on the responses of lower secondary teachers.
2. Controlling for the following teacher variables: gender, years of teaching experience, subject taught in the target class and type of employment contract.
3. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below one denotes a negative association, an odds ratio above one indicates a positive association and an odds ratio of one means that there is no association.

Notes: Only countries and economies with available data are shown.

Statistically significant values are marked in a blue tone.

Countries and economies are ranked in descending order of teachers' likelihood of having attended professional development activities including ICT skills for teaching during the last 12 months.

Source: OECD, TALIS 2018 Database, www.oecd.org/education/talis/TIF35_Tables_Teachers_training_and_use_of_ICT_in_COVID-19_crisis.xlsx, Table 9

The bottom line

As education systems move to a "new normal" where traditional face-to-face teaching will be complemented by some form of distance learning, teachers may require training to prepare them to use innovative teaching practices. Although TALIS data were collected before the COVID-19 crisis, they remain relevant regarding the take up of training in the use of ICT in teaching. The analyses presented in this briefing suggest that including ICT for teaching in teachers' initial formal training could be an instrument to encourage them to continue to develop their ability to use new technology in teaching. Teachers whose pre-service education included the use of ICT in teaching are not only more likely use it in the classroom, but also to take advantage of professional development that includes ICT skills for teaching. However, whether and how teachers integrate ICT into their classroom practice is influenced by a wide array of organisational and system-level conditions, in addition to their pre-service education and in-service training. The few months of the pandemic have taught us that work organisation, collaboration among colleagues and with stakeholders, as well as the presence of an environment where entrepreneurship and progress are recognised and promoted, are necessary conditions for the adoption of innovative teaching practices.

Notes

1. The tables referred to in this *Teaching in Focus* brief can be found at: www.oecd.org/education/talis/TIF35_Tables_Teachers_training_and_use_of_ICT_in_COVID-19_crisis.xlsx.

2. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable with two categories (e.g. yes/no) or more than two categories. An odds ratio below one denotes a negative association, an odds ratio above one indicates a positive association and an odds ratio of one means that there is no association. For instance, if the association between teachers' reported ICT preparedness (the explanatory variable) and use of ICT in classroom practice (the outcome variable) is being analysed, the following odds ratios would be interpreted as:
   - **0.2**: teachers feeling "well" or "very well" prepared to use ICT for teaching are five times less likely to let students use ICT for projects or class work, at least frequently, than their counterparts who feel "not at all" or "somewhat" prepared.
   - **1**: teachers feeling "well" or "very well" prepared to use ICT for teaching and teachers feeling "not at all" or "somewhat" prepared to use ICT for teaching are equally likely to let students use ICT for projects or class work, at least frequently.
   - **1.1**: teachers feeling "well" or "very well" prepared to use ICT for teaching are 10% more likely to let students use ICT for projects or class work, at least frequently, than their counterparts who feel "not at all" or "somewhat" prepared.
   - **2**: teachers feeling "well" or "very well" prepared to use ICT for teaching are twice as likely to let students use ICT for projects or class work, at least frequently, as their counterparts who feel "not at all" or "somewhat" prepared.

Visit

www.oecd.org/education/talis/

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For more information

The tables referred to in this *Teaching in Focus* brief can be found at:
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